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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,577	07/28/2003	Stephen M. Breit	P1714US01	5025

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EXAMINER

NGUYEN, NINH H

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,577

Applicant(s)

BREIT ET AL.

Examiner

Ninh H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4,6-12,14,16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☐ Claim(s) 3,4,6-12,14 and 17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 02 June 2006 have been fully considered but they are not persuasive.

Regarding the Kao reference Applicant argues the diffuser hub of Kao is formed by the revolution of two lines segments while the claims require the diffuser hub is formed of a line segment. Further, Applicant points out that the impeller hub profile of Kao is formed by two linear portions and a curved portion while the impeller hub assembly of the invention only requires the revolution of a third line segment that is inclined to the longitudinal axis of the pump assembly. Regarding claim 17, Applicant points out that Kao does not disclose a radial stage. Regarding claim 17, Applicant alleges Kao does not disclose a pump assembly capable of producing diagonal flow paths.

Regarding the Stjernstrom reference, Applicant argues the diffuser hub profile and the impeller hub profile each is formed by the revolution of a curved segment, not a line segment as claimed. Regarding claim 17, Applicant alleges neither Stjernstrom nor Kao discloses pump structures capable of producing diagonal flowpaths, therefore, claim 17 is not anticipated by prior art.

The Examiner respectfully disagrees.

Claim 1 only requires the hub profile is formed by the revolution of a line segment (emphasis added) that is inclined to the longitudinal axis of the pump assembly. There is no limitation in claim 1 requiring the diffuser profile is formed entirely by the revolution of a single line that is inclined to the longitudinal axis of the pump. In addition, by visual inspection of

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drawing figures 2-4 of the disclosure, one can see that neither the hub profile nor the diffuser profile of the invention is formed entirely by the revolution of a single line segment. As Applicant admitted in the Remarks section, the diffuser hub profile of Kao is formed from the revolution of a line segment that is inclined to the longitudinal axis of the pump assembly. Therefore, Kao anticipates claim 1.

Similarly, claim 6 only requires the hub profile is formed by the revolution of a line segment that is inclined to the longitudinal axis of the pump assembly. There is no limitation in claim 6 requiring the diffuser profile is formed entirely by the revolution of a single line that is inclined to the longitudinal axis of the pump. As Applicant admitted in the Remarks section, the impeller hub profile of Kao is formed from the revolution of a line segment that is inclined to the longitudinal axis of the pump assembly. Therefore, Kao anticipates claim 6.

Regarding claim 14, Kao discloses a multi-stage diagonal flow pump assembly. Since the fluid flow path is inclined to the longitudinal axis of the pump assembly, the fluid flow path has both axial and radial components. Therefore, Kao anticipates claim 14.

Regarding claim 17, Kao clearly disclose pump structures including impellers and diffusers guiding the fluid flow in the directions that are inclined to the longitudinal axis of the pump. This flow pattern is essentially a diagonal flow. Therefore, Kao anticipates claim 17.

As for the Stjernstrom reference, it is clearly stated that the pump of Stjernstrom is a diagonal pump which has all the structures including a diagonal impeller assembly 5 which guides the flow at an inclined angle away from the axis of rotation, a diffuser assembly which

converges the flow toward the central axis of the pump. These are all characteristics of a diagonal flow pump. Therefore, Stjernstrom anticipates claim 17.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 3, 4, 6-12, 14 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kao.

Kao discloses a pump assembly (Figs. 1, 3, 4) comprising a housing 20, a first stage 12 having an impeller assembly 40, and a diffuser assembly; the diffuser assembly 64 (see reproduced Fig. 4) comprising a diffuser hub having a diffuser hub profile is formed by the revolution of a first line segment that is inclined to the longitudinal axis of the pump assembly; and a diffuser shroud having a diffuser shroud profile; the impeller assembly comprising an impeller hub having an impeller hub profile, wherein the impeller hub profile is formed by the revolution of a third line segment that is inclined to the longitudinal axis of the pump assembly; and an impeller shroud line having an impeller shroud line profile;

wherein the diffuser shroud profile is formed by the revolution of a second line segment to parallel or co-linear to the first line segment that is inclined to the longitudinal axis of the pump assembly (Fig. 4);

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wherein the impeller shroud line profile is formed by the revolution of a fourth line segment that is inclined to the longitudinal axis of the pump assembly (Fig. 4);

wherein the impeller further comprises a balance hole 58;

wherein the diffuser further comprises a thrust washer (col. 4, lines 48-51);

wherein the pump assembly comprises a plurality of stages (Fig. 4);

wherein each of the plurality of stages includes an impeller and a diffuser that are cooperatively configured to produce a diagonal flow path (Fig. 4); and

wherein different diagonal flow path are produced by the plurality of stages (Fig. 4).

4. Claim 17 is rejected under 35 U.S.C. 102(b) as being anticipated by Stjernstrom.

Stjernstrom discloses a pump assembly (Figs. 1-4) comprising a housing 4, 12; a shaft and means for producing diagonal flowpaths as fluid moves through the pump assembly comprising a diagonal impeller assembly 5 and a diffuser assembly 3 .

Allowable Subject Matter

5. Claim 16 is allowed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

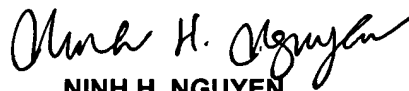
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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ninh Nguyen whose telephone number is (571) 272-4823. The examiner can be normally reached on Monday-Friday from 7:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look, can be reached at (571) 272-4820. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, please go to <http://pair-direct.uspto.gov> or contact the Electronic Business center (EBC) at 866-217-9197 (toll-free).


NINH H. NGUYEN
PRIMARY EXAMINER

Nhn
August 7, 20069